

CLAIMS

We claim:

1. A method for generating a multiplex of media streams, the method comprising:
receiving a set of media streams that comprises first type media stream components and second type media stream components;
applying a modification process that is not adapted to modify second type media stream components, such as to provide at least one modified first type media stream component; and
multiplexing at least the second type media stream components and the modified first type media stream components.
2. The method of claim 1 wherein the second type media stream packets are encrypted such as not to facilitate their modification.
3. The method of claim 1 wherein the modification process involves lossy compression.
4. The method of claim 1 wherein the modification process involves lossless compression.
5. The method of claim 1 wherein the modification process involves altering a size of at least one media stream component.
6. The method of claim 1 wherein the modification process involves altering a timing of transmission of at least one media stream component.
7. The method of claim 1 wherein the step of multiplexing further comprises multiplexing non-modified first type media stream components.
8. The method of claim 1 wherein the step of modifying comprises executing modification sessions in a periodical manner.
9. The method of claim 8 wherein each modification session is associated with a group of media stream components that are received during a certain time period.
10. The method of claim 8 wherein each modification session is associated with media stream components of a certain aggregate size.
11. The method of claim 8 wherein each modification session is associated with a group of media stream components to be transmitted during a certain time period.

12. The method of claim 8 wherein each modifications session is associated with media streams components of the set of media streams that were not transmitted.
13. The method of claim 8 wherein at least one modification session includes modifying a size of at least one media stream component of the group, evaluating the size of the at least one modified non-encrypted media stream component, and determining whether additional modification is required.
14. The method of claim 8 wherein at least one modification session includes modifying a timing of at least one media stream component of the group, evaluating the timing of the at least one modified non-encrypted media stream component, and determining whether additional modification is required.
15. The method of claim 12 wherein the additional modification comprises modifying a non-modified non-encrypted media stream component of the group or re-modifying a modified media stream component of the group.
16. The method of claim 1 wherein at least one media stream of the set is partially encrypted.
17. The method of claim 1 further comprising determining at least one control parameter.
18. The method of claim 17 wherein the determination is followed by selecting an encrypted version of a media stream out of multiple distinct encrypted versions.
19. The method of claim 18 wherein the distinct encrypted versions differ from each other by a parameter that is video quality, encryption level or size.
20. The method of claim 18 wherein the distinct encrypted versions differ from each other by the manner that they were generated.
21. The method of claim 17 wherein the determination is followed by altering an encryption of a media stream.
22. The method of claim 17 wherein the determination is followed by altering the modification process.
23. The method of claim 17 further comprising assigning encryption priorities to media stream components and wherein encryption is altered in response to the at least one control parameter and the encryption priorities.

24. The method of claim 17 wherein a media stream is represented by multiple layers and whereas the determination is followed by altering at least one layer, deleting one layer or adding a new layer.
25. The method of claim 17 wherein a media stream is represented by multiple layers and whereas the determination is followed by altering the selection of layers that undergo encryption.
26. The method of claim 17 further comprising assigning modification priorities to media stream components and determining at least one control parameter in response to the modification priorities.
27. The method of claim 17 wherein the at least one control parameter is determined in response to the modification process.
28. The method of claim 17 wherein the at least one control parameter is determined in response to an encryption scheme applied on media stream components.
29. The method of claim 17 further comprising assigning encryption priorities to media stream components and determining at least one control parameter in response to the encryption priorities.
30. The method of claim 17 wherein the determination is responsive to the target bit rate, the bit rate of encrypted media stream components and of non-encrypted media stream components previously received.
31. The method of claim 17 wherein the determination is responsive to the timing and size associated with received media stream components.
32. The method of claim 1 wherein the step of modifying comprises selecting between encrypted media stream components and non-encrypted media stream components.
33. The method of claim 32 wherein the step of selecting comprises analyzing at least one encryption indication associated with at least one media stream component.
34. The method of claim 1 further comprising assigning modification priorities to media streams and modifying media stream components in response to the modification priorities.
35. The method of claim 1 wherein at least one media stream of the set is represented by multiple layers and at least a portion of at least one layer is encrypted.

36. The method of claim 35 wherein the layers comprise a base layer and at least one supplemental layer.
37. The method of claim 35 wherein the layers provide spatial scalability.
38. The method of claim 35 wherein the layers provide temporal scalability.
39. The method of claim 35 wherein the layers are generated by filtering.
40. A method for partially encrypting a media stream, the method comprising the steps of: receiving a media stream; converting the media stream to multiple layers; and encrypting at least a portion of at least one layer.
41. The method of claim 40 wherein the step of encrypting comprises encrypting a portion of at least one layer while not encrypting at least one other layer.
42. The method of claim 40 wherein the multiple layers comprise base layer and at least one quantized layer.
43. The method of claim 40 wherein the multiple layers comprise a base layer and at least one supplemental layer.
44. The method of claim 40 wherein the multiple layers provide spatial scalability.
45. The method of claim 40 wherein the layers provide temporal scalability.
46. The method of claim 40 wherein the layers provide various levels of filtering.
47. A method for partially encrypting a media stream, the method comprising the steps of: receiving multiple layers that represent a media stream and encrypting at least a portion of at least one layer.
48. The method of claim 47 wherein the step of encrypting comprises encrypting a portion of at least one layer while not encrypting at least one other layer.
49. The method of claim 47 wherein the multiple layers comprise a base layer and at least one quantized layer.
50. The method of claim 47 wherein the multiple layers comprise a base layer and at least one supplemental layer.
51. The method of claim 47 wherein the multiple layers provide spatial scalability.
52. The method of claim 47 wherein the layers provide temporal scalability.
53. The method of claim 47 wherein the layers are generated by filtering.
54. An apparatus for generating a multiplex of media streams, the apparatus comprising:

an interface, for receiving a set of media streams that comprises first type media stream components and second type media stream components;

a statistical multiplexing unit for applying a modification process, that is not adapted to modify second type media stream components, such as to provide at least one modified first type media stream component, and for multiplexing at least the second type media stream components and the modified first type media stream components.

55. The apparatus of claim 54 wherein the second type media stream packets are encrypted such as not to facilitate their modification.

56. The apparatus of claim 54 wherein the modification process involves lossy compression.

57. The apparatus of claim 54 wherein the modification process involves lossless compression.

58. The apparatus of claim 54 wherein the modification process involves altering a size of at least one media stream component.

59. The apparatus of claim 54 wherein the modification process involves altering a timing of at least one media stream component.

60. The apparatus of claim 54 wherein the modification process involves altering a timing of transmission of at least one media stream component.

61. The apparatus of claim 54 wherein the statistical multiplexing unit is further adapted to multiplex non-modified first type media stream components.

62. The apparatus of claim 54 wherein statistical multiplexing unit is adapted to apply the modification process in modification sessions.

63. The apparatus of claim 62 wherein each modification session is associated with a group of media stream components that are received during a certain time period.

64. The apparatus of claim 62 wherein each modification session is associated with media stream components of a certain aggregate size.

65. The apparatus of claim 62 wherein each modification session is associated with a group of media stream components to be transmitted during a certain time period.

66. The apparatus of claim 62 wherein each modifications session is associated with media streams components of the set of media streams that were not transmitted.

67. The apparatus of claim 62 wherein at least one modification session includes modifying a size of at least one media stream component of the group, evaluating the size of the at least one modified non-encrypted media stream component, and determining whether additional modification is required.
68. The apparatus of claim 62 wherein at least one modification session includes modifying a timing of at least one media stream component of the group, evaluating the timing of the at least one modified non-encrypted media stream component, and determining whether additional modification is required.
69. The apparatus of claim 68 wherein the additional modification comprises modifying a non-modified non-encrypted media stream component of the group or re-modifying a modified media stream component of the group.
70. The apparatus of claim 54 wherein at least one media stream of the set is partially encrypted.
71. The apparatus of claim 54 wherein the apparatus is further adapted to determine at least one control parameter.
72. The apparatus of claim 71 wherein the apparatus is adapted to select, in response to the determination, an encrypted version of a media stream out of multiple distinct encrypted versions.
73. The apparatus of claim 72 wherein the distinct encrypted versions differ from each other by a parameter that is video quality, encryption level or size.
74. The apparatus of claim 72 wherein the distinct encrypted versions differ from each other by the manner that they were generated.
75. The apparatus of claim 71 wherein apparatus is adapted to alter an encryption of a media stream in response to the determination.
76. The apparatus of claim 71 wherein the apparatus is adapted to alter the modification process in response to the determination.
77. The apparatus of claim 71 whereas encryption priorities are associated with media stream components and whereas the apparatus is adapted to alter the encryption in response to the at least one control parameter and the encryption priorities.

78. The apparatus of claim 71 wherein a media stream is represented by multiple layers and whereas the apparatus is adapted to alter at least one layer, delete one layer or add a new layer, in response to the determination.
79. The apparatus of claim 71 wherein a media stream is represented by multiple layers and whereas the determination is followed by altering the selection of layers that undergo encryption.
80. The apparatus of claim 71 wherein media stream components are associated with encryption priorities and wherein the determination of at least one control parameter is responsive to the encryption priorities.
81. The apparatus of claim 71 wherein media stream components are associated with modification priorities and wherein the determination of at least one control parameter is responsive to the modification priorities.
82. The apparatus of claim 71 wherein the apparatus is adapted to determine at least one control parameter in response to an encryption scheme applied on media stream components.
83. The apparatus of claim 71 wherein the determination is responsive to the target bit rate, the bit rate of encrypted media stream components and of non-encrypted media stream components previously received.
84. The apparatus of claim 54 wherein the interface is capable of selecting between encrypted media stream components and non-encrypted media stream components.
85. The apparatus of claim 84 wherein interface is adapted to select in response to an analysis of at least one encryption indication associated with at least one media stream component.
86. The apparatus of claim 54 wherein media streams are associated with modification priorities to media streams and wherein the statistical multiplexing unit is adapted to modify media stream components in response to the modification priorities.
87. The apparatus of claim 54 wherein at least one media stream of the set is represented by multiple layers and at least a portion of at least one layer is encrypted.
88. The apparatus of claim 87 wherein the layers comprise a base layer and at least one supplemental layer.
89. The apparatus of claim 87 wherein the layers provide spatial scalability.

90. The apparatus of claim 87 wherein the layers provide temporal scalability.
91. The apparatus of claim 87 wherein the layers are generated by various levels of filtering.
92. An apparatus for partially encrypting a media stream, the apparatus comprising: an interface for receiving a media stream; a media stream processing unit, for converting the media stream to multiple layers; and an encryption unit for encrypting at least a portion of at least one layer.
93. The apparatus of claim 88 wherein the encryption unit is adapted to encrypt a portion of at least one layer while not encrypting at least one other layer.
94. The apparatus of claim 88 wherein the multiple layers comprise a base layer and at least one quantized layer.
95. The apparatus of claim 88 wherein the multiple layers comprise a base layer and at least one supplemental layer.
96. The apparatus of claim 88 wherein the multiple layers provide spatial scalability.
97. The apparatus of claim 88 wherein the layers provide temporal scalability.
98. The apparatus of claim 88 wherein the media stream processing unit is adapted to convert a media stream by performing manipulations and filtering.
99. An apparatus for partially encrypting a media stream, the apparatus comprising the steps of: an interface for receiving a multiple layers that represent a media stream and an encryption unit for encrypting at least a portion of at least one layer.
100. The apparatus of claim 99 wherein the encryption unit is adapted to encrypt a portion of at least one layer while not encrypting at least one other layer.
101. The apparatus of claim 99 wherein the multiple layers comprise a base layer and at least one quantized layer.
102. The apparatus of claim 99 wherein the multiple layers comprise a base layer and at least one supplemental layer.
103. The apparatus of claim 99 wherein the multiple layers provide spatial scalability.
104. The apparatus of claim 99 wherein the layers provide temporal scalability.
105. The apparatus of claim 99 wherein the media stream processing unit is adapted to convert a media stream by performing manipulations and filtering.

106. An electronically readable medium having stored thereon computer readable code to permit a computer to affect a method for generating a multiplex of media streams, the method comprising: receiving a set of media streams that comprises first type media stream components and second type media stream components; applying a modification process that is not adapted to modify second type media stream components, such as to provide at least one modified first type media stream component; and multiplexing at least the second type media stream components and the modified first type media stream components.

107. A computer readable medium having code embodied therein for causing an electronic device to perform the steps of: receiving a media stream; converting the media stream to multiple layers; and encrypting at least a portion of at least one layer.

108. A computer readable medium having code embodied therein for causing an electronic device to perform the steps of: receiving a multiple layers that represent a media stream and encrypting at least a portion of at least one layer.

109. A computer readable medium having code embodied therein for causing an electronic device to perform the steps of: receiving a set of media streams that comprises first type media stream components and second type media stream components; applying a modification process that is not adapted to modify second type media stream components, such as to provide at least one modified first type media stream component; and multiplexing at least the second type media stream components and the modified first type media stream components.